

REMARKS

This paper is responsive to the Office Action dated December 23, 2008. Presently, claims 46-72 stand rejected. For the following reasons, reconsideration is respectfully requested.

Objection to the Drawings:

The drawings were objected to for failing to comply with 37 CFR 1.84(p)(5) for including certain reference characters not mentioned in the description, and for failure to include a reference sign mentioned in the description. Paragraph 3 of page 15 has been amended as set forth at page 2 of this paper to correct obvious errors in the original submission. Accordingly, it is believed that this objection is overcome.

Objection to Claim 51:

Claim 51 has been objected to under 37 CFR 1.75(c) for failing to properly limit the subject matter of a previous claim. Claim 51 has been amended as set forth at page 5 of this paper. Accordingly, it is believed that this objection is overcome.

Section 102(b) and Section 102/103 Rejections:

Claims 46 and 50 were rejected under 35 U.S.C. § 102(b) as anticipated by O'Rear et al. (WO 01/64610 A1). Claims 48-49, 51-57 and 71 were rejected under 35 USC § 102(b) as being anticipated by, or in the alternative under 35 USC § 103(a) as being obvious over O'Rear et al.

The present invention relates to a process for producing linear alkyl benzene and linear paraffin. An important feature of the invention is that the inventors have found that it is possible to take the hydrocarbon condensate of a Fischer-Tropsch reaction containing olefins and paraffins, remove oxygenates from the condensate, and provide a stream which is the product of a Fischer-Tropsch reaction, and which contains paraffins and sufficient olefins to be able to pass the stream through an alkylation

reactor and obtain a linear alkyl benzene product as well as a linear paraffin product, without first having to dehydrogenate the feedstream.

Claim 46 is the only independent claim in the application. The remaining claims depend, directly or indirectly, from claim 46. According to independent claim 46, the hydrocarbon stream in steps a), b) and c) containing paraffins and olefins **is the product of a Fischer-Tropsch reaction**. This is recited, e.g., at page 5, line 7 of the specification. It is also clear from the specification that the Fischer-Tropsch stream is not altered in a chemical reaction before alkylation, and thus the olefins in the stream are the product of a Fischer-Tropsch reaction, and not some other chemical reaction such as a dehydrogenation reaction.

Claim 47 further defines features of the invention. According to this claim, in step b) of the process, the olefin/paraffin ratio in the stream is substantially preserved during the oxygenate extraction step. This is further described, e.g., at page 9, line 30, page 13 line 1 and page 20, line 24 of the specification.

O'Rear et al discloses a process for preparing alkylbenzene using fractions from a Fischer-Tropsch reaction. O'Rear et al states, at page 2 lines 14-16, that the fractions are optionally but preferably treated, for example, by hydrotreating or extraction, to remove oxygenates and other by-products. In the detailed description at page 12 lines 3-4 of O'Rear et al, it is stated that the Fischer-Tropsch stream is preferably hydrotreated to remove any oxygenated products. At page 4 lines 19-20 of the detailed description of the invention and in Figure 1 of O'Rear et al, it is stated and shown that a C₁₈₋₂₆ fraction from a Fischer-Tropsch reaction is dehydrogenated to form C₁₈₋₂₆ olefins, which are used to alkylate aromatics. Thereafter at page 30 lines 14-15 it is stated that the paraffinic C₁₈₋₂₆ fraction must be converted into olefins, for example, via dehydrogenation chemistry. It is clear that, although O'Rear et al mentions extraction to remove oxygenates, the preferred method of oxygenate removal is hydrotreatment. Furthermore, irrespective of the type of oxygenate removal step, O'Rear et al teaches that the fraction must be hydrogenated prior to the alkylation step. Thus, olefins

subjected to the alkylation reaction in O'Rear et al are the product of a dehydrogenation reaction, and not the product of a Fischer Tropsch reaction.

At page 2 lines 25-27 in the Summary of the Invention, it is stated in O'Rear et al that depending on the particular Fischer-Tropsch conditions, the C₁₈₋₂₆ fraction may include sufficient olefins and alcohols such that it can be directly reacted with aromatics to form alcohol benzenes. In this case, where O'Rear et al suggests the direct reaction of the C₁₈₋₂₆ fraction in an alkylation reaction without a dehydrogenation step, no oxygenate removal step is suggested. If an oxygenate removal step did take place, the fraction would not "include sufficient olefins and alcohols", because the alcohols would have been removed. Accordingly, where a direct alkylation step is suggested in O'Rear et al, no oxygenate removal step is suggested, and this reference actually teaches away from the present invention because it would indicate that the inventors did not believe that it would be possible to remove oxygenates from a stream which is the product of a Fischer-Tropsch reaction and still have sufficient olefins for an alkylation reaction to form alkyl benzene.

Although the dehydrogenation and recycle steps g) and h) are alluded to O'Rear et al, O'Rear et al does not teach or disclose step b) of claim 46, which is the extraction of oxygenates, and the combination of the stream containing olefins and paraffins from step b), which is the product of a Fischer-Tropsch reaction, with the stream from step g), resulting in a reduction in the recycle flow rate of step g) which leads to savings in both capital expenditure and operating costs (see page 9 lines 6-8 and page 14 line 29 to page 15 line 12 of the specification of this application). It is quite surprising that it is possible to remove oxygenates from the feed-stream from the Fischer-Tropsch reaction and still have sufficient olefins in the feed stream (which is the product of a Fischer-Tropsch reaction) to attain the benefit of the reduced recycle rate of the paraffins in step g), without any intervening chemical reaction. Accordingly, it is respectfully submitted that claim 46, and the claims depending therefrom, are both novel and inventive in view of O'Rear et al.

Section 103(a) Rejections:

Claims 47, 58-70 and 72 were rejected under 35 U.S.C. § 103(a) as being unpatentable over O'Rear in view of Becker (DE 19911910 A1) and De Wet et al. (WO 02/31085 A2).

As regards the rejection that the claims are unpatentable over O'Rear et al. in view of Becker and/or De Wet et al., Applicant respectfully points out that O'Rear et al. teaches that hydroformylation is the preferred oxygenate removal step (page 12 lines 3-4). This teaching would dissuade a person skilled in the art from using the extraction methods disclosed in Becker and De Wet et al.

In addition, even if the hydrotreatment step (the preferred oxygenate removal step) of O'Rear et al were replaced with the extraction step described in Becker or De Wet et al., the claimed process would still not be attained because a person skilled in the art would still be led by O'Rear et al. to dehydrogenate the stream prior to the alkylation step (at page 30 lines 14-15 of O'Rear et al. it is stated that the paraffinic C₁₈-₂₆ fraction must be converted into olefins, for example, via dehydrogenation chemistry).

As discussed above, it is quite surprising that it is possible to remove oxygenates from the feed-stream from the Fischer-Tropsch reaction and still have sufficient olefins in the feed stream (which is the product of a Fischer-Tropsch reaction to attain the benefit of the reduced recycle rate of the paraffins in step g), without any intervening chemical reaction. This result is neither taught, nor suggested, in the cited combination of references. Accordingly, it is submitted that these claims are not obvious in view of the cited combination.

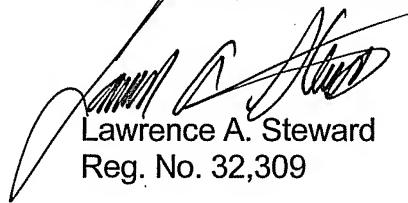
In addition, as previously stated, claim 46 is the only independent claim in the application. Claims 47, 58-70 and 72 depend therefrom, and therefore include all of the limitations of claim 46, including the limitations of subparagraphs b), g), and h), as

described above. Therefore, it is submitted that these claims are allowable over the cited art for this additional reason.

Conclusion:

Based upon the foregoing, Applicants respectfully submit that the present invention, as claimed herein, is novel and inventive in view of the prior art cited by the Examiner. Accordingly, Applicants respectfully request the issuance of a Notice of Allowance. If the Examiner believes the prosecution of this application can be advanced by way of a telephone conversation, the Examiner is respectfully invited to telephone the undersigned attorney.

Respectfully submitted,



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